DIRECTED ENERGY HYPERSONIC INTERCEPTION

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Canada's defence policy, *Strong Secure Engaged*, emphasizes our continued commitment to North American Defence, and collaboration with the United States to ensure NORAD is prepared to confront evolving threats to the continent. Such threats include hypersonic cruise missiles (HCM) and hypersonic glide vehicles (HGV). Hybrid analytical and statistical modelling concludes that high energy lasers (HEL) cannot reliably intercept hypersonic threats over Canada, when employed by land-based systems. In the absence of unclassified data, the analytical model was based on thermal protection systems employed in the Space Shuttle Orbiter and initialized with thermographic data from the hypersonic re-entry of the Space Shuttle Discovery. The model indicated that contemporary HEL could feasibly damage hypersonic targets in the mid-course phase under ideal conditions. However, historical data shows high levels of cloud coverage in vicinity of prospective interceptor sites. Thus, any land-based interception scenario would deviate from the ideal. More practical analysis then shows that the atmospheric attenuation associated with common HEL wavelengths demands exponentially greater power emission than is currently achievable.

Figure 1. Raytheon Stryker-Based 50 kW Directed Energy Maneuver-Short Range Air Defense HEL (Example)

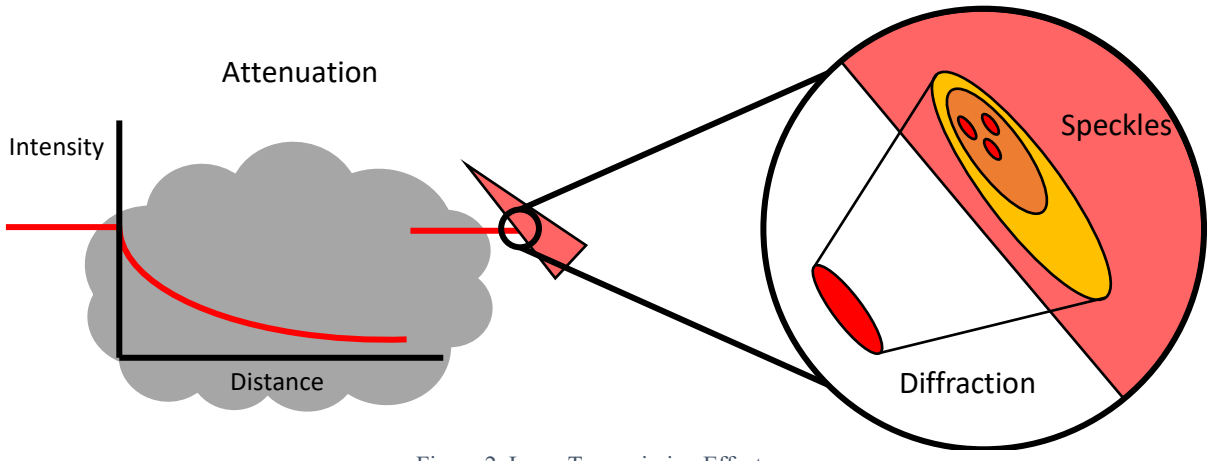

Figure 2. Laser Transmission Effects.